

REMARKS

Entry of the foregoing and reconsideration of the subject application are respectfully requested in light of the amendments above and the comments which follow.

As correctly noted in the Office Action Summary, claims 1-24 were pending (claims 16 and 17 withdrawn). By the present response, claims 5, 15 and 20 have been amended, claims 16 and 17 canceled, and claims 25 and 26 have been added. Thus, upon entry of the present response, claims 1-15 and 18-26 remain pending and await further consideration on the merits.

Support for the foregoing amendments can be found, for example, in at least the following locations in the original disclosure: the original claims and paragraphs [0013], [0032], [0036] and [0039] to [0040].

CLAIM REJECTIONS UNDER 35 U.S.C. §103

Claims 1, 5, 13-14, 18, 21 and 23 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 3,497,737 to Philofsky (hereafter "*Philofsky*") in view of the collecting teachings of U.S. Patent No. 5,793,130 to Anderson (hereafter "*Anderson*") and the prior art referred to by U.S. Patent No. 4,585,607 (hereafter "*Krackeler*"), and also in view of the collective teachings of U.S. Patent No. 3,910,011 to Beninger (hereafter "*Beninger*"), U.S. Patent No. 4,116,116 to Barnett (hereafter "*Barnett*") and U.S. Patent No. 4,155,970 to Cassell (hereafter "*Cassell*") on the grounds set forth in paragraph 5 of the Official Action.

Claims 2-3, 6, 12, 15 and 24 stand rejected under 35 U.S.C. §103(a) as being unpatentable over *Philofsky*, the collective teachings of *Anderson* and the prior art

referred to by *Krackeler*, and also the collective teachings of *Beninger*, *Barnett*, and *Cassell* as applied to claim 1 above, and further in view of the Admitted Prior Art in the specification of this present application on the grounds set forth in paragraph 6 of the Official Action.

Claims 4 and 20 stand rejected under 35 U.S.C. §103(a) as being unpatentable over *Philofsky*, the collective teachings of *Anderson* and the prior art referred to by *Krackeler*, the collective teachings of *Beninger*, *Barnett*, and *Cassell*, and the Admitted Prior Art as applied to claim 2 above, and further in view of U.S. Patent No. 4,135,553 to Evans (hereafter "*Evans*") and U.S. Patent No. 5,624,618 to Forman et al. (hereafter "*Forman et al.*") on the grounds set forth in paragraph 7 of the Official Action.

Claims 7-9 and 22 stand rejected under 35 U.S.C. §103(a) as being unpatentable over *Philofsky*, the collective teachings of *Anderson* and the prior art referred to by *Krackeler*, and also the collective teachings of *Beninger*, *Barnett*, and *Cassell* as applied to claim 1 above, and further in view of U.S. Patent No. 4,589,939 to Mohebban et al. (hereafter "*Mohebban et al.*") on the grounds set forth in paragraph 8 of the Official Action.

Claim 10 stands rejected under 35 U.S.C. §103(a) as being unpatentable over *Philofsky*, the collective teachings of *Anderson* and the prior art referred to by *Krackeler*, and also the collective teachings of *Beninger*, *Barnett*, and *Cassell* as applied to claim 1 above, and further in view of U.S. Patent No. 3,946,480 to Dienes (hereafter "*Dienes*") on the grounds set forth in paragraph 9 of the Official Action.

Claim 11 stands rejected under 35 U.S.C. §103(a) as being unpatentable over *Philofsky*, the collective teachings of *Anderson* and the prior art referred to by

Krackeler, and also the collective teachings of *Beninger*, *Barnett*, and *Cassell* as applied to claim 1 above, and further in view of U.S. Patent No. 5,985,062 to Vallauri et al. (hereafter "*Vallauri et al.*") on the grounds set forth in paragraph 10 of the Official Action.

Claim 19 stands rejected under 35 U.S.C. §103(a) as being unpatentable over *Philofsky*, the collective teachings of *Anderson* and the prior art referred to by *Krackeler*, and also the collective teachings of *Beninger*, *Barnett*, and *Cassell*, and also in view of the Admitted Prior Art as applied to claim 3 above, and further in view of *Krackeler* on the grounds set forth in paragraph 11 of the Official Action.

For at least the reasons noted below, these rejections should be withdrawn.

The rejection based on the hypothetical combination of disclosures contained in *Philofsky*, *Anderson*, *Krackeler*, *Beninger*, *Barnett*, and *Cassell* should be withdrawn because the criteria for a *prima facie* case of obviousness as discussed at MPEP §2143 have not been met. Namely, the proposed combinations do not contain each and every element of applicants' claims.

As previously noted on page 11 of applicants' response submitted October 17, 2003, the disclosure in *Philofsky* relied upon in the Official Action discloses insulation 18 of conductor 17 of a conventional wrap-type. A person with ordinary skill in the art of rotating electrical machines at the time of the *Philofsky* disclosure would understand that *Philofsky's* disclosure of conventional wrap type insulation is generally understood to be a combination of taping, impregnation, and the curing process.

Further, one of ordinary skill in the art at the time of the *Philofsky* disclosure would have understand that heavy sheet insulation 19 generally consists of several

layers of glass-mica tape bonded by a brittle and elastic thermoset material wherein the rectangular shape is produced by having the tape insulation on the conductor in a mold during impregnation and curing.

In addition, elastomers used in conventional processes are conventionally understood to have bad electrical properties since they are generally condensation type materials in the corrosive by-products developed during manufacture or unacceptable in electrical properties amongst other reasons.

Therefore, as a whole, the disclosure in *Philofsky* is not as asserted in the Official Action silent as to how the sheet is applied to a conductor bar. Rather, one of ordinary skill in the art would have understood it to be a conventional tape-impregnation-curing process.

The Official Action at paragraph 13 indicates that these previous arguments have been considered but were not persuasive as "mere speculation." To illustrate the technical point highlighted in applicants' prior submission, applicants provide herein several references outlining the state of the art contemporaneous to the disclosure in *Philofsky*.

These contemporaneous references (*Britsch et al.*, *Neidhöfer* and *Emery et al.*) are discussed below:

Britsch et al. (published nine months prior to the filing of the *Philofsky* disclosure) describes insulation for stators of high-voltage machines. It is disclosed that these windings are produced with a fully-cured and continuous synthetic resin insulation. At page 532, column 2, beginning at line 8, *Britsch et al.* disclose that the main insulation consists of glass fibers backed with mica tape, which is continuously

wound around the bundle of conductors forming the coil. The curing process is disclosed at page 531, column 1, line 3 ("fully-cured").

Neidhöfer (dating from 1992) discloses at page 6, column 2 that a milestone in high-voltage insulation was the development of modern insulation systems in the 50's and 60's. These systems were based on mica-glass-fiber tapes and synthetic impregnation resins. See page 6, column 2.

Finally, *Emery et al.* describes at page 226 that the state of the art at the time of its publication (*Emery et al.* dates from 1996) was glass-backed mica paper utilized in a tape-vacuum impregnation system using epoxy resin to build ground wall insulation. Impregnation and curing is also mentioned at page 227. *Emery et al.* is published by authors of Westinghouse, the same company which employed *Philofsky* at the time of his disclosure. *Emery et al.* indicates that even in 1996 the glass mica tape-impregnation-curing processes from the 50's and 60's disclosed in the *Britsch et al.* and *Neidhöfer* articles, as well as in *Philofsky*, were still considered to be state of the art.

From the above, applicants have shown that one of ordinary skill in the art at the time of *Philofsky* would not have understood the disclosure therein to be a shrink wrap sleeve method. Rather, applicants have demonstrated by contemporaneous evidence that the standard in the art and what one of ordinary skill in the art would understand from the disclosure in *Philofsky* is directed to glass mica tape-impregnation-curing processes and not the methods and systems disclosed by applicants. Accordingly, any combination relying upon the disclosure in *Philofsky* is improper as the basis for an obviousness rejection because the disclosure in *Philofsky* in combination with the references cited in the Official Action does not

contain each and every element of applicants' claims. Further, the disclosure in *Philofsky* in combination with the cited references does not teach or suggest to one of ordinary skill to use a shrink sleeve. For at least these reasons, the rejection should be withdrawn.

Applicants have previously discussed shrink-on sleeve technology in the cable industry. This discussion has also noted several deficiencies in that prior system and notes that the present system of insulating stators of rotating electrical machines is quite different. In particular, applicants have noted that transferring technology from a circular cross-section to a rectangular cross-section is not trivial, as one would have to address stress concentrations at the corners of the rectangular cross-section not encountered in circular cross-sections of cable technology. Other examples of differences have been previously presented and are incorporated here by reference.

Finally, applicants respectfully note that any reliance upon the silence of *Philofsky* to find disclosure of applicants' present independent claims is misplaced. Namely, any finding in the silence of *Philofsky* would have to be founded upon inherency.

As is known, for an element to be inherent in the disclosure, such element must necessarily be so. "Such evidence must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill." and "Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient." Continental Can Co., U.S.A. v. Monsanto Co., 20 U.S.P.Q.2nd 1746, 1749 (Fed. Cir. 1991).

In other words, for the claimed method to be inherent in *Philofsky*, every insulating system that could be used in the *Philofsky* reference must have the claimed features. It is not sufficient that a insulation system that meets the description set forth in the *Philofsky* disclosure may have the claimed elements. See, In re Rijckaert, 28 U.S.P.Q.2d 1955, 1957 (Fed. Cir. 1993). ("The mere fact that a certain thing may result from a given set of circumstances is not sufficient to establish inherency.")

There is no reason based on the teachings of *Philofsky* that such an insulation must necessarily have the claimed features. Accordingly, the claimed method is not inherent in *Philofsky*. The rejection set forth by the Examiner is based on an incorrect understanding of the doctrine of inherency and the rejection must be withdrawn.

The rejection of applicants' independent claims also cites the disclosure in *Anderson and Krackeler*. These references are relied upon to show the use of heat shrinkable sleeves as insulation for electrical conductors and stator windings is allegedly known in the art. However, both of these references disclose insulation based on circular cross-sectional support and shrink elements and do not support the tendered position.

First, as previously presented, the circular cross-section cable technology based disclosure of shrink sleeves do not contribute, disclose, teach, or suggest to one of ordinary skill in the art the application of a rectangular cross-section to stator windings (a completely different technology from cabling). Accordingly and as described both in the prior response and above with respect to *Philofsky*, the technology of applying a circular cross-section to a circular cable element does not

necessarily transfer to applying a shrink sleeve to a rectangular cross-section as claimed here. Rather, there are inherent stress factors, boundary conditions, and additional technological developments required that are not necessarily obvious to enable the presently claimed method. The present application discloses such points in its specification. See, for example, paragraphs [0030]-[0033].

In addition to the discussion above regarding the disclosure in *Anderson* and *Krackeler*, applicants respectfully disagree with the Examiner's interpretation of the *Anderson* reference. *Anderson* clearly merely teaches the use of shrink-on sleeves in cable technology. The reference and the Official Action do not address the above-noted deficiencies with respect to applicants' claims and the deficiencies of this reference when in combination as proposed in the obviousness rejection.

Further, applicants respectfully assert that one of ordinary skill in the art considering the disclosure in *Anderson* would understand the disclosure to teach insulating electrical conductors with a shrinkable sleeve merely to protect a device element from debris generated by the device. In such a case, the sleeve has no electrical function. Nor does the mere coincidence that a device element could be a winding have any bearing. Rather, the device element could be any electrical element or other element requiring protection such as a switch, a capacitor, a resistor or any other. Furthermore, and more importantly, the whole winding in *Anderson* is encapsulated by the shrink sleeve. This disclosure does not mean that the electrical conductor (the wire) is insulated. Rather, one of ordinary skill in the art would understand that the sleeve does not insulate one wire from another and does not insulate the wires against the core of the winding. Accordingly, the disclosure of

the use of the sleeve in *Anderson* is completely deficient with respect to applicants' method and application.

Krackeler and particularly *Anderson* do not contribute any disclosure, teaching, or suggestion to one ordinary skill in the art to place a shrink-on sleeve from cable technology over a conductor bar in a stator for the insulating purposes. For at least this further reason, the rejection is improper and should be withdrawn.

The Examiner cites *Beninger*, *Barnett*, and *Cassell* for their alleged disclosure of heat shrinkable sleeving on various articles. From these disclosures it is reasoned that it would have been obvious to one ordinary skill in the art to apply a sheet as a heat shrinkable sleeve to any particular cross-section of an article regardless of the cross-sectional shape. Applicants respectfully traverse the application of these references in the combination proposed.

Specifically, *Beninger* and *Barnett*, which both describe a method for packaging goods with shrinkable plastic film, are completely different applications from the presently claimed methods and system. Films used in packaging (shrinkable or non-shrinkable) have absolutely no electrical function. It is often possible to accept large defects in such films without any impact on their function.

In contrast, applicants' claim the application for electrical insulation of conductor bars. In such an application, the shrink sleeve is electrically stressed by high voltage. Even a small defect in the insulation can have catastrophic consequences. See, for example, applicants' specification at [0036]. Thus, applicants respectfully assert that no person of ordinary skill would take into account the use of the technologies in *Beninger*, *Barnett* and *Cassell* to high voltage insulation technology.

In addition, plastic films used for packaging are generally manufactured by blowmolding. Due to the blowmolding method, film is produced as a quasi-infinite tube by the extrusion dye, which has a circular cross-section and constant wall thickness around the circumference of the tube. In contrast, applicants' sleeve for insulating the conductor bar (as claimed in new claim 25) discloses a sleeve having different thicknesses at two different pairs of slides. These different thicknesses contribute to adequate contact with the surface of the rectangular conductors bars and are also a manifestation of the modifications necessary for use of rectangular shaped sleeves on a conductor bar in the electrical application.

For at least the reasons noted above, applicants respectfully assert that an obviousness rejection over the cited references is improper. As understood by one of ordinary skill in the art and in consideration of the references as a whole and the state of the art at the time of those references, one would not have understood the technologies to have been applicable to electrical insulation, nor do they disclose applicants' claimed method of using a rectangular shrink-on sleeve. Applicants respectfully request withdrawal of the rejections.

Applicants' dependent claims are distinguishable over each of the cited references for at least the same reason as disclosed above with respect to independent claim 1. Accordingly, the rejection with regard to applicants' dependent claims should also be withdrawn.

With respect to claims 2 and 24, the Examiner on page 5 alleges that although *Philofsky* is silent as to mechanically dilating the shrink-on sleeve in its cold state and applying the sleeve around an outer periphery before the support sleeve is

pulled over the conductor bar, it "appears" that applicants teach this feature.

Applicants respectfully assert that reliance on this alleged disclosure is unfounded.

In light of the silence in the cited references and the minimal and undetailed disclosure in applicants' alleged admission, any combination rejecting applicants' claims 2 and 24 must be founded on impermissible hindsight or an improper application of inherency.

If relying on hindsight, the above-stated ground of rejection is deficient in that it fails to state the requisite degree of motivation as to why one of ordinary skill in the art would have been motivated to modify the teachings of *Philofsky* in the manner proposed. Moreover, it is clear that the stated motivation for modifying the teachings of *Philofsky* has not been derived from the prior art, but rather from the applicants' own disclosure. Thus, the rejection is based upon impermissible hindsight.

If relying on inherency, the Examiner is incorrect. As discussed above, there is not basis for finding applicants present claims inherent in the glass mica tape-impregnation-curing processes of *Philofsky*. See, Continental Can Co., U.S.A. v. Monsanto Co., 20 U.S.P.Q.2d 1746, 1749 (Fed. Cir. 1991) and In re Rijckaert, 28 U.S.P.Q.2d 1955, 1957 (Fed. Cir. 1993).

With respect to claim 3, applicants again note that the rejection is improper as either being based on improper hindsight and/or as not containing each and every element of applicants' claims is required by an obviousness rejection under MPEP §2143.

In particular, applicants note that what is described in the background of applicants' specification is shrink-on sleeves for cable technology. Elements and methods known from the prior art and cable technologies fail to form an appropriate

ground wall (or main) insulation on conductors of stator windings of rotating electrical machines. In addition, the design of shrink-on sleeves and support sleeves have to be changed (as disclosed in applicants' specification) to use shrink-on technology for insulating conductors of stator windings of rotating electrical machines with rectangular cross-sections. Thus, it would not have been obvious to one of ordinary skill in the art to remove the support sleeves as suggested by the applicants. Nor is it obvious to use shrink-on sleeves on conductors of stator windings of rotating electrical machines based on the combined disclosures cited in the rejection. Accordingly, for at least these reasons, the rejection of claim 3 should be withdrawn.

With respect to claim 6, applicants respectfully traverse the rejection based on the combination in *Philofsky* and applicants' alleged admissions. *Philofsky* is silent as to dilation of the sheath 19 by compressed air and pulling the sheath in a cold state over the conductor bar. As noted above, *Philofsky* discloses mica tape in an impregnation curing system. The solid and inelastic behavior of the *Philofsky* system makes it implausible to expect, as asserted in the Official Action, that one of ordinary skill in the art would have tried to select a method of dilating the sheath 19 by compressed air and pulling the sheath in a cold state of the conductor bar.

First, the sheath 19 is not slipped over the element in *Philofsky*. Rather, the sheath 19 is built up by wrapping insulation tape around the conductor, impregnating the hole and curing it in heat. Therefore, the sheath 19 of the prior art has no need to be slipped over the conductor.

Further, because of its rigid nature, any attempt to dilate the sheath 19 by compressed air would have resulted in a cracked sheath 19 before any insignificant

dilation would have been generated. A cracked sheath would have been directly contrary to the purpose of the insulation of *Philofsky*.

Accordingly, the proposed modification fails as a grounds for an obviousness rejection because the proposed modification would alter and/or destroy the functioning of the underlying *Philofsky* reference. The MPEP notes that a combination of references resulting in a prior art reference being unsatisfactory for its intended purpose is improper. See, MPEP §2143.01. Here, the combination proposed by the Examiner would result in the tape-based insulation of *Philofsky* being destroyed and not providing the intended insulation properties.

With respect to claim 12, applicants respectfully note that any attempt by one of ordinary skill in the art to bend the conductor with the insulation sheet 19 of *Philofsky* would have led to cracked insulation sheath 19 due to the small strain at brake value of disclosed mica-glass-tape impregnated and cured system. First, this rejection is improper because as noted above with respect to claim 6, the proposed modification renders one or the other references (here the *Philofsky* reference) unsuitable for its intended use. Namely, the proposed modification destroys the insulation of *Philofsky* rendering it unuseful for its intended purpose. See MPEP §2143.01.

With respect to claim 15, applicants respectfully note that they are not claiming the invention of Roebel-transposed arrangements or non-Roebel transposed arrangements, but merely are disclosing a method to insulate conductor bars wherein the conductor bars are specified more in detail to be made without Roebel-transposed arrangements at the involute. This rejection of claim 15 should

be withdrawn for at least the same reasons as discussed above with respect to the independent claims.

The cited references in this rejection do not describe a support sleeve, which supports the dilated shrink-on sleeve from the inner side of the shrink-on sleeve and which is heated in order to melt in order to remove the retaining force to give the shrink-on sleeves the conditions to shrink to its original state or to shrink on to a conductor bar positioned within the shrink-on sleeve whereas the hot melt used for bonding to the substrate is originally the support. For example, no additional step to remove a support element has to be done after shrinking. See claims 4 and 20.

In contrast, the disclosure in *Evans* explains retaining arrangements where an expanded elastomer tube is bonded on an outer surface to a restraint tube. The bond is created by adhesion or by using an additional adhesive. The restraint tube is removed after breaking the bond to allow the expanded elastomer to peel away from the outer retaining tube. The adhesive, if used, does not have any support function. The support function is only managed by the outer tube. The adhesive, if used, also does not have any function for bonding the elastomer tube to the substrate.

Further, the support in *Evans* has to be removed by whatever means because it cannot be a part of the combination substrate-elastomer as the support resides at the outside of the elastomer and will not include the bonding to the substrate and in the case of melting the support a molten layer with random uneven structure will occur.

The disclosure in *Foreman et al.* is directed to a method to manufacture hollow articles of braided composite parts. Mandrels are used where the complex structure should be hollow after curing a resin. The mandrels are removed after the

curing by melting or dissolving. The mandrel material is completely removed and has no function after curing the resin. The cured composite material does not shrink after melting or dissolve the mandrel material. Thus, the disclosure in *Foreman et al.* is not related to the present application and does not contribute to the rejection.

From the above, applicants respectfully assert that the disclosure in *Evans* and *Foreman et al.* are not directed to an application of electrical stator windings. Further, these disclosures each suffer from deficiencies that limit and/or prevent there application by one of ordinary skill in the art in the proposed combination. Accordingly, applicants' claims 4 and 20 are not obvious in view of the proposed combination and withdrawal of the rejection is respectfully requested.

The disclosure in *Mohebban et al.* does not contribute to overcome the above-noted deficiencies in the primary and secondary references. Accordingly, the rejection at paragraph 8 of the Official Action should be withdrawn for at least the same reasons as discussed above with respect to the independent claim.

In addition, with respect to claim 8, applicants respectfully note that the glass-mica wound tape impregnation and curing system of *Philofsky* cannot form the basis for a co-extrusion, blowing, molding process because such a disclosed glass-mica-tape process in *Philofsky* is not adaptable and has not been shown to be adaptable to such methods. Accordingly, the rejection of claim 8 should be withdrawn for at least this further reason.

The disclosure in *Dienes* does not contribute to overcome the above-noted references in the primary and secondary references discussed above. In addition, applicants respectfully traverse the view that it would have been obvious for one of ordinary skill in the art to apply adhesive to the inside of the sheath of *Philofsky*.

Specifically, applicants note that using an adhesive in the insulation of *Philofsky* would be useless or even counterproductive. Any adhesive between the conductor and the tape or between different layers of the tape in the disclosed system of *Philofsky* potentially produces gas inclusions within the adhesive which would not be removed by the subsequent vacuum-pressure impregnation process. Thus, the insulation quality of the proposed combination would be worse than for a conventional process. Accordingly, one of ordinary skill would not combine the noted disclosures because such combination would reduce or eliminate the effectiveness of the *Philofsky* glass-mica wound tape insulation process. For at least this further reason, the rejection should be withdrawn.

The disclosure in *Vallauri et al.* is relied upon mainly to show the use of extruded elastomeric materials. It does not contribute to overcome the above-noted deficiencies with respect to *Philofsky* and the secondary references. Accordingly, claim 11 is distinguishable over the cited references for at least the same reason as discussed above with respect to claim 1.

Claim 19 depends from directly from claim and indirectly from claims 2 and 1. Accordingly, claim 19 is distinguishable over the cited references for at least the same reasons as discussed above with respect to these prior claims.

In addition, applicants respectfully note that the shrink-on sleeve (in claim 2) is mechanically dilated and positioned around an outer periphery of a support sleeve. In other words, the support sleeve is positioned at the inner interface of the shrink-on sleeve. In contrast, the disclosure in *Krackeler* clearly shows that the dilated element is bonded to an inner surface of the support means. In other words, the bonded helical opening of the support is at the outside of the shrinkable element in

the disclosure in *Krackeler* whereas in the present application, the helical opening is at the inside of the shrinkable element. In addition, the disclosure in *Krackeler* differs from applicants' claims at issue because they describe a support and shrink element which both have circular cross-sections whereas the support and shrink-on sleeve of the present application has a rectangular cross-section.

For at least these additional reasons, applicants respectfully request this rejection be withdrawn.

CONCLUSION

From the foregoing, further and favorable action in the form of a Notice of Allowance is earnestly solicited. Should the Examiner feel that any issues remain, it is requested that the undersigned be contacted so that any such issues may be adequately addressed and prosecution of the instant application expedited.

Respectfully submitted,

BURNS, DOANE, SWECKER & MATHIS, L.L.P.

Date: April 19, 2004

By: 

Jeffrey G. Killian
Registration No. 50,891

P.O. Box 1404
Alexandria, Virginia 22313-1404
(703) 836-6620